Counting What Counts

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WHAT BIG DATA CAN DO FOR THE CULTURAL SECTOR

Anthony Lilley with Professor Paul Moore

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www.magiclantern.co.uk

“Everything that can be counted does not necessarily count; everything that counts cannot necessarily be counted.”

Albert Einstein

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Executive Summary

The current approach to the use of data in the cultural sector is out-of-date and inadequate. The sector as a whole and the policy and regulatory bodies which oversee it are already failing to make the most of the considerable financial and operational benefits which could arise from better use of data. In addition, a significant opportunity to better understand and possibly increase the cultural and social impact of public expenditure is going begging.

It is high time for a step-change in the approach of arts and cultural bodies to data and for them to take up and build on the management of so-called "big data" in other sectors.

This report aims to set the issues in a wide strategic context. The overall objective is to help senior cultural decision-makers to understand the importance and urgency of the need to think differently about the potential of big data and to encourage them to set in train changes to the environment, the metrics and the skills to make the most of big data which are needed to harness its potential.

There are some fundamental barriers to the use of big data approaches in arts and cultural institutions. The first is environmental. The sector currently largely addresses data from too limited a perspective. Too often, the gathering and reporting of data is seen as a burden and a requirement of funding or governance rather than as an asset to be used to the benefit of the artistic or cultural institution and its work. This point of view is in danger of holding the sector back. It arises partly from the philosophy of dependence, subsidy and market failure which underpins much of the cultural sector including the arts and public service broadcasting.

A shift in mindset to one which sees data more as an asset and not just as a tool of accountability is a fundamental requirement of making the most of the "big data opportunity" envisaged by this paper. Importantly, such a shift which would match much of the rhetoric of

"investment" which is used in the sector, particularly by policy and funding bodies. To date, this paper suggests, this rhetoric has largely been just that; a new term to replace the loaded word "subsidy" rather than a genuine change.

The second major obstacle is the limited strategic understanding of or indeed interest in the use of data at senior levels in the cultural sector. For many, the potential of data in the cultural sector is at best a "known-unknown" or worse goes entirely unappreciated. For some, the idea of using data in the the arts is controversial or even anathema. Limited day to day data management skills in many parts of the sector and often less than ideal technology in many organisations contribute to a sense of strategic drift. And yet, there are, of course, islands of passionate expertise and effective activity.

Without question, the effective use of big data (so-called data-driven decision-making or DDD) has the potential to deliver operational and financial benefits to individual cultural organisations in obvious fields such as marketing and development and, in turn, through the ways in which it might inform artistic decision-making.

This paper calls, ultimately, for a strategic approach to sectoral change, to capacity building and to joining up and scaling existing work with a view to achieving a step change in the way that data can help improve the resilience of the cultural sector.

Measuring better AND measuring more

But there is more than this. The analysis of big data in other sectors is starting to uncover the possibility of new ways of measuring the impact of arts and cultural investment on our wider society in terms of social capital and cultural value creation. Increasingly-sophisticated approaches to the measurement of the structure of and activity on social networks, including sentiment analysis and behavioural analytics, are giving glimpses of a future in which it will be increasingly possible to track, measure and influence the spread of ideas and the coming together of groups of people and associated changes in their behaviour both on- and off-line.

This is an exciting field in which there is much still to learn. Firstly, however, the cultural sector needs to get into position to take advantage of data in the daily running of its business. From that base, given it's very cultural function, the sector could be uniquely positioned, especially when set against many commercial and public sector alternatives, to take advantage of and, indeed, to lead the development of new ways of measuring impact. This could include both the development of specific tools which are used and, crucially, the way in which personal data is held and issues such as privacy and data-protection are managed.

The entry requirement of this vision of the future for the cultural sector is a strategic shift of mindset towards a culture of investment and its associated requirement for sophisticated measurement. This requires the more widespread use of data and associated models of data-driven decision-making (DDD) in the arts and cultural sector. Without this solid base, the potential to change the terms of debate around the creation of social capital and cultural value which could be afforded by these new approaches to and technologies of measurement cannot be achieved. There is much to do.

The Data Maturity Spectrum

This paper looks at the use of data and specifically big and social data in the arts, broadcasting and wider cultural sectors. It delineates three (overlapping) phases of data maturity[1] which, it is suggested, apply to most organisations, in whatever sector and of whatever scale.

One of the aims of this paper is that arts organisations themselves, as well as funders and policy makers, should consider and debate the applicability of this model. Assuming that they are able to recognise some value in it, the next step is to understand their own position on the data maturity spectrum and how they might develop a strategy to move forward along the spectrum towards a mature usage of data in which all its benefits are reaped. The three stages are not mutually exclusive and there are other ways of identifying them.

Data 1.0 - data exists about core operations (eg ticket sales) but is used mainly for marketing and sales, often in relatively unsophisticated ways.
There is very little data-driven decision-making (DDD).

Data 2.0 - data specific to the digital domain is added to the mix. There is little integration with Data 1.0 material. Many organisations struggle with the quantity and meaning of data and with data quality. Inconsistent approaches within and between organisations are common.
"Digital" data (e.g. web traffic) is most often used to consider "digital" issues which are often considered separately from the rest of the business.
There is little data-driven decision-making (DDD)

1 For the purposes of this document, data maturity refers to the comparative level of effective usage of different forms of data in the overall management of organisations.

Data 3.0 - characterised by an integrated, customer-centred approach to all data from both the physical and digital domains. Over time, measures of impact begin to supplement and even replace measures of activity and output (such as "hits"). DDD is a key tool of management decision-making and board governance.

The Current Position

Based on extensive research and practical experience, this paper argues that many, indeed most, arts and cultural institutions find themselves either with Data 1.0 or, more usually, Data 2.0 status.

The funding, governance and regulatory regimes of the arts and broadcasting systems as a whole are just entering the Data 2.0 phase.

Naturally, some individual arts and cultural players are tiptoeing towards Data 3.0 in their own strategies and many "born digital" entities entered the data maturity spectrum at that point (Data 3.0) to begin with. The aim of using this concept of the spectrum is not to demarcate individual organisations. It is intended as a tool to think with and no more.

Three Next Steps

Clearly, not all cultural organisations stand at the same point on the spectrum of data-readiness described in this report. Any activity undertaken in response to the recommendations of this report should, therefore, be graduated to take this into account. It will be important to factor in the needs of different kinds of organisations at different levels of data maturity into the thinking. Likewise, it will be productive also to harness the knowledge and capability of some individuals and institutions to act as pathfinders and to help each other along the road.

This paper proposes three strands of work to engage with the "big data opportunity".

1) New Data Strategies

- Cultural organisations, policymakers, funders and regulators should audit their use of data, internally and externally to establish a current baseline. This baseline should then be benchmarked against "big data" approaches from other sectors.

- A timed strategic action plan should be established against specific milestones with regular periodic reviews of both progress and scope.

- A significant outcome should be the development or refinement of data strategies within cultural organisations themselves.

- From the point of view of funders and regulators, new, big data evaluation metrics and KPIs for (e.g.) funded or regulated organisations - by Arts Council England, OfCOM or others - should be developed and then deployed at the next opportunity (such as an NPO funding round, PSB review etc). A graduated approach may be necessary to take account of the differing levels of data maturity of organisations and their range of commercial models.

- Arts Council England should consider the requirements for the establishment of a UK Arts Data API

2) Pathfinder Projects

- Pathfinder Projects should be set up to explore approaches to data management in the culture sector including assessing the integration of existing data sources, data presentation/visualisation for internal and external use and new forms of measurement.

- Applied R&D activity should be funded to help arts and cultural organizations understand their data 'assets' and systems and to look at the relationship between cultural value/social capital formation and state of the art social media metrics.

- Projects could form part of the NESTA/Arts Council England R&D Fund and/ or be funded in partnership with commercial organisations. Future digital investments, such as successors to The Space, have a key role to play in adopting best practice in their own right and also in ensuring that the learning from pathfinder projects and their own commissions is shared.

3) Capacity-building

- Capacity-building projects for policymakers, funders and boards should be established to develop the necessary philosophy and skills to embed a culture of data-driven decision-making at the highest level. This will enable the cultural sector to utilise data in their own operations in the most effective way to promote efficiency and resilience and, in due course, to respond to new requirements for data from the funding organisations and regulators.
- Consideration should be given to the appropriateness and timing of the use of data being a requirement of (e.g.) funding agreements.

- Capacity-building funds from within Arts Council England's Creative Media Strategy could be utilised for this purpose in the short term.

- Thought should be given to how to maximise the impact of investments such as The Space in this capacity-building programme.

The vision of this paper is that it is possible to begin the necessary policy and strategic changes to start on this journey relatively easily. Alongside that process of strategic change should come practical experimentation and capacity building.

Development projects and live experiments should be run to develop tools and establish some of the basic methodologies of big and social data specifically when used in the cultural sector context. Many of these will focus, by necessity, on the potential for improved sales or development income, on improved operational efficiency and on the reduction of duplication of effort and expenditure. In the sense that they could increase the resilience of organisations, they will have an impact on the cultural missions of those organisations.

Success in these areas will, in turn, lead to better strategic decision-making and new product innovation. In due course, they will help foster a more responsive approach to the reach and impact of cultural work itself which can be fed into artistic decision-making. There is, in principle, no hard and fast distinction between marketing and artistic programming/decision-

making. Indeed, in many cases the opposite is already true. An informed digital "zeitgeist" can be used as part of the artistic process just as much as any other kind of input. Or, indeed, ignored, as the case may be.

Finally, and, perhaps in the end of greater significance in the long run, the use of big data could add considerably to the arguments around the cultural and social value which comes from public investment. As it becomes more possible to measure the impact of cultural activity, the old arguments around subsidy and market failure will be augmented by something more subtle than simplistic measures of visitor or audience numbers, costs of production and the like.

It is high time that some of the hotly felt opinions which make up so much of the cultural debate in the UK were supplemented with more and better data. Luckily, technology and changes in user behaviour are making that more possible with each passing day.

This report suggests three routes along the journey to a "big data" approach to culture in the UK with a view to both improving the resilience of the sector itself and providing more data with which to have a better informed version of the perpetual discussion about the merits of cultural investment. For cultural players as diverse as Arts Council England, NESTA, the BBC, Channel Four, OfCOM and many others the time to start on that journey is now

Chapter 1: The Explosion of Big Data

We are surrounded by data and yet the arts and cultural sector is some way from getting to grips with the opportunity it presents.

With each passing day, digital technology is generating more and more available data about everything from the products people buy in supermarkets, the websites they visit, their search queries and who their friends are, to whether they are feeling ill. This explosion of so-called "big data" has profound implications for the arts and culture. Big data is a loose term which is commonly used to mean the increasing volume, velocity and variety of data created by digital technology and, in particular, the amount of data which arises from the scaling effects of digital networks. The term is often also used as a shorthand to describe what can be done with that data.

Everything from the running of the smallest event to the very way society thinks about and manages overall investment in arts, culture and broadcasting looks different when seen through the lens of big data. Each sector of cultural activity can benefit if it is able to respond to the opportunities. But taking advantage of big data, which encompasses new approaches to measurement, sophisticated analytics and the adoption of the models of decision-making which they necessitate, will require policymakers and practitioners alike to tackle significant challenges, some of them novel.

1.1 Understanding where we are; the three stages model

What follows is a simplification but, hopefully, a useful tool for thinking about the current stage at which an organisation finds itself and where it might think about looking to develop. This Data Maturity Spectrum has been developed simply as an at-a-glance tool and, as such, is not a sophisticated measure. Perhaps at least one Pathfinder Project, as specified by this report, might look to develop detailed tools to assist organisations in diagnosing their current position and identifying next steps. For now, and for the purposes of this report, the simplified approach will suffice.

Data 1.0 - data exists about core operations (eg ticket sales) but is used mainly for marketing and sales, often in relatively unsophisticated ways.
There is very little data-driven decision-making (DDD).

Data 2.0 - data specific to the digital domain is added to the mix. There is little integration with Data 1.0 material. Many organisations struggle with the quantity and meaning of data and with data quality. Inconsistent approaches within and between organisations are common.
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Data 3.0 - characterised by an integrated, customer-centred approach to all data from both the physical and digital domains. Over time, measures of impact begin to supplement and even replace measures of activity and output (such as "hits"). DDD is a key tool of management decision-making and board governance.

1.1.1 Data 1.0

Today, cultural organisations are not making the most of even their existing data. Many organisations are still struggling to really take advantage of what this paper has referred to as Data 1.0, namely a stage of digital development in which they manage data about the core activities of the organisation using digital tools such as databases and box office systems. Competence in this stage is merely the entry requirement for the successful use of big data. Things have moved on with the advent of social networks, web and mobile usage to what this paper terms Data 2.0 and this has added both to the opportunities and the challenges for cultural organisations.

1.1.2 Data 2.0

Data 2.0 is the capturing of data from activities on digital networks such as web traffic and social networks. So-called born digital projects, such as The Space[2], which do not have their roots in traditional venue or location-based art forms or institutions, but rather take place wholly in the digital sphere, are more likely to capture this kind of data than traditional building-based or festival activity. Too often, however, the data is inadequately collected, left in raw, un-analysed form and/or not brought into play in strategic decision-making. Increasingly, organisations are at risk of drowning under reams of data including traffic stats, clickstream data and social network analytics. These data are often assiduously, even enthusiastically, reported but seldom understood and acted upon. And there is more data all the time.

2 http://thespace.org/ - Arts Council England's experimental online arts service piloted with the BBC in Summer 2012.

Culture 24's action research project, Let's Get Real[3] published in September 2011 laid bare the state of play of the measurement of online activity amongst a group of leading arts organisations. In a clear-sighted and honest appraisal, the report highlighted the need for significant improvement in the understanding of the potential of data in the arts - even when focused mainly on online activity alone. The project came to similar conclusions to this project, albeit focusing mainly at the level of the individual arts institution and its current activity.

There are two kinds of response to the increase in data. The first is to dive ever deeper, to capture more data even though at risk of drowning. The second is to step back and take a fresh look at the why and how of data collection in cultural organisations and to apply fresh thinking. This paper refers to such an approach as Data 3.0.

1.1.3 Data 3.0

The first step to adopting Data 3.0 is to focus not primarily on the data, the technologies or the systems but to think about the user or participant in the artistic activity. The necessary, user-centric thinking involves a shift from a producer-led view to a consumer-led view. It is no surprise, therefore, to see the benefits of this approach being more clearly visible already in "born digital" companies such as Google, Amazon and Facebook, which have a close interaction with millions of individual users, than in our theatres or galleries. Digital-centric properties such as the phenomenally successful Moshi Monsters[4] illustrate this approach perfectly. The child who plays the game is presented with a perfectly user-centred "dashboard" in the form of their room, a space which combines data, communication and navigation in harmony. The purpose of the dashboard, no matter how literally presented (or otherwise) is to provide an environment in which to monitor activity as well as a leaping off point for new tasks.

3 http://weareculture24.org.uk/projects/action-research/how-to-evaluate-success-online/

4 www.moshimonsters.com

1.2 Customer-centricity

So far, very few cultural organisations are taking the necessary step of adopting a truly user-centric perspective on data. Perhaps the most visible indicator of this approach is the use of an all-encompassing CRM (customer relationship management system) integrating the many sources of data they currently have available to them in an appropriate way. CRM has been defined as "the establishment, development, maintenance and optimisation of long-term, mutually valuable relationships between consumers and organisations". CRM includes but goes beyond the use of basic audience segmentation and postcode analysis to the level of the individual, allowing deep segmentation and indeed personalisation of both messaging and products themselves. It assists with both the targeting of potential consumers and the methods used to communicate with them - and much of it can be managed at least semi-automatically with the use of sufficiently sophisticated software.

Given the daily demands on arts organisations, taking a strategic approach to audience relationships is often overwhelmed by the demands of the sales cycle. But other organisations which compete for a share of leisure time, from sports to restaurants, media companies to social networks are adopting CRM approaches which means that failing to keep pace with them - and with leaders in the arts sector as they adopt the techniques - will no longer be an option. The risk is being left behind at least as much as not leaping ahead. CRM will soon be the minimum requirement for the operational management and accountability needs of cultural bodies, though it is worth noting that this paper goes on to argue for data to be used even more aggressively and in such a way as to move beyond the current accountability and marketing paradigm.

1.3 Data-driven organisations

To truly benefit from the potential of data, there is a need for a profound strategic objective, namely a move towards being a data-driven organisation. Underpinning each of the points along the continuum to becoming a Data 3.0 organisation is the need to fully factor data-driven thinking into operational decision-making processes. In turn, strategic decisions too should be informed by data wherever possible.

At the time of writing, data is currently under-used in many board-level governance processes. To some extent, this is a catch-22 problem. Unless senior management and boards are aware of the potential of data to improve their organisation, they are unlikely to value and much less to drive the necessary changes to systems, staffing and processes which are needed to obtain and understand that data. Likewise, without the pull of a more

enlightened approach to data from funders and regulators, the likelihood of widespread adoption of a more modern approach to data at the level of organisations is reduced. At the time of writing, both policy/funder level awareness and usage of big data are low. This can be be of little help in driving the benefits of big data further down the chain into organisations themselves despite the very considerable benefits which could accrue. It is low levels of awareness that have given rise to one of the main recommendations of this report, namely that funders should support "Pathfinder Projects" that would test and build, in a practical, experimental fashion, on some of the strategic insights in this report.

A useful start in this direction is the work of Audience Data UK who have seeked to harmonise audience data sets, not merely for administrative reporting purposes but because such an approach has the potential to help organisations to better deliver their missions. The Audience Focus Fund has been delivering very useful benchmarking and segmentation approaches and tools. Greater adoption of both the approach and the specific outputs of this work should be part of the baseline for cultural organisations which are serious about harnessing data. However, this report recommends going further and quickly.

1.4 The Benefits of big data

A recent report from the McKinsey Global Institute[5] is amongst many which are beginning to make the case for the potential benefits of big data across the private and public sectors. McKinsey identify five ways in which big data can create value.

- Segmenting audiences to customise activity
- Creating Transparency
- Supporting/replacing human decisions
- Enabling experimentation
- Innovating new business models and services

5http://www.mckinsey.com/insights/mgi/research/technology_and_innovation/big_data_the_next_frontier_for_innovation

1.4.1 Segmenting audiences to customise activity

The capacity for data-gathering and relatively simple database-driven audience segmentation have been key drivers over the last ten to twenty years of the adoption by many arts organisations of Data 1.0 strategies at least with reference to their sales and audience development and fundraising activity. Work such as Arts Council England's Arts Audiences Insight[6], which divides the possible arts audience into thirteen segments, has provided the arts sector with a better understanding, at the macro level, of its audience - and still provides valuable perspective for strategic and policy-level decision-making. As an approach to detailed understanding of large datasets, however, this model has, increasingly, had its day. It is now both possible and necessary to employ more data and with more detail and granularity in pursuit of the same aims.

Notwithstanding this, concepts such as the thirteen audience segments can be very valuable for reasons which go beyond their value as data per se. As a model of storytelling about data, audience segmentation work can help with understanding and promoting data-led decision-making. Sometimes, after all, there is too much data to explain easily - and segmentation can be presented as a simplification of the whole.

However, the use of such approaches in the 'multi-channel' context in which most institutions now find themselves is already taxing legacy box office and database systems. In many organisations segmentation alone cannot deliver on the promise of big data at the level of the individual organisation. This is in part because of a lack of consistency in the way in which data has been gathered but, as has been explained above, more fully because segmentation is, in some ways, a stepping stone on the way towards a big data approach. For the full potential of big data to be realised, a more fundamental review and a more holistic approach are needed.

What if, for example, at the cross-sectoral level, even more was made of collaborative marketing approaches by, literally, combining data, on a live and ongoing basis, within particular locations, genres or artforms?

It is also important to note that better audience insights and relationships can go far beyond traditional sales and marketing processes to change the nature of the audience and even the artistic experience itself. These range from simple personalisation measures such as the provision of drinks orders to the delivery of targeted media (such as downloads) supporting

6 http://www.artscouncil.org.uk/media/uploads/pdf/arts_audience_insight_2011.pdf

the event experience right through to the possibility of integrated personal interaction directly with the art itself.

1.4.2 Creating Transparency

As the McKinsey report[7] says, "Simply making big data more easily accessible to relevant stakeholders in a timely manner can create tremendous value". An integrated big data approach has the potential to reduce delays and duplication between departments in cultural institutions, of course, but it could offer much more. What if aggregated customer activity data were shared between funders and their funded bodies on a live basis? Gone would be the need for monthly or annual report writing with its natural tendency to focus on one particular "story" to tell. In addition, much of the heat could also be taken out of political debate if, for instance, verifiable, real time data were accessible across the arts and cultural sector relating to attendance and impact. In areas such as the measurement of public value , funders and regulators have a critical dual role both to improve their own operations and governance and, in tandem, catalyse or support change in their sectors. Real-time data could be a real boon to this.

1.4.3 Replacing/supporting human decisions

Of course, no one questions that human input and experience are and will remain essential to much decision-making. The current, changing environment calls for sophisticated thinking which avoids the temptation of setting up simple, unrealistic dualities. There is no competition between a data-driven approach and human wisdom and experience so long as the architecture for data-gathering and the way in which data is interrogated and narrated are clear. In this sense we are talking about the improvement and refinement of human decision-making with support from data.

Sometimes, there will be decisions which genuinely are better made by technology. If algorithms are capable of calculating insurance premiums and selling shares, there is no a priori reason why they can't be used to target lapsed attenders or potential donors, a point well made in Matthew Bowcock's report, Democratising Philanthropy[8]. There is great potential for sophisticated analysis to improve decision-making, minimise risks and possibly unearth valuable, hidden patterns and insights. If the data sets are large enough, as they increasingly are, genuine and sometimes surprising patterns can be found. The recent rash

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7http://www.mckinsey.com/insights/mgi/research/technology_and_innovation/big_data_the_next_frontier_for_innovation

8 http://www.culture.gov.uk/news/media_releases/9604.aspx

of best-selling economics titles such as Freakonomics[9] has done much to popularise the notion that data can sometimes to be used to disprove commonly held beliefs and assumptions. Leading-edge studies of human decision-making such as those reported in Daniel Kahnmann's Thinking, Fast and Slow[10] and the earlier The Paradox of Choice[11] are reflecting growing evidence that decision-making is often subject to rules (or heuristics) which are implicit and hidden to the individual but which can be detected using statistical analysis.

But which kinds of decisions can be replaced or assisted? Certainly, there is much routine analysis of audience data which could be replaced with more sophisticated tools. But might artistic directors benefit from the extra information they could gain from data about previous audience sizes and responses to a programming choice for instance?

This question brings into relief another largely false dichotomy in much arts discourse, namely that there is, or should not be, a relationship between audience demand or indeed satisfaction and artistic decision-making. Whilst it would be clearly absurd, impractical and fruitless to subject all such decisions to research and analysis in a kind of over the top version of so-called government by focus group, it is increasingly naive and impractical to assert a total disconnect between artistic decisions and the wider context of audience demand. Data is not a substitute for decision-making, but rather an aid to it. After all, it will never be that all the circumstances of, for instance, a future artistic programming choice will ever have been replicated in the past but that doesn't invalidate additional and possibly valuable information if it can be brought into play. Whilst the ultimate decision should still be guided by taste, personality and experience, it is unlikely to be harmed by a little more knowledge being stirred into the mix.

At a higher level of the system, namely that of the policy-maker, funder or regulator, increased use of data to guide decision-making is a necessity. Regulators such as OfCOM make much of their evidence-based processes and would surely profit from even better information. Whilst the often finely judged decisions which need to be made cannot rely solely on the "rear view mirror", (i.e. data from the past) trends and the direction of change can be more easily identified to assist in those decisions. Crucially, also, the ability to look at measures of impact and indices of such hard to test concepts as "quality" could bring whole new tools within the grasp of organisations such as these.

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9 http://www.freakonomics.com/

10 Kahneman, D. (2011) Thinking, Fast and Slow Farrar, Straus and Giroux

11 Schwartz, B. (2004) The Paradox of Choice: Why More Is Less, Harper Collins http://www.ted.com/talks/barry_schwartz_on_the_paradox_of_choice.html

1.4.4 Enabling experimentation

If more transactional data were gathered and analysed by cultural organisations, it would give them the potential to run genuine experiments to discover the efficacy of, for instance, sales and marketing techniques and approaches. Knowing more about your audience allows you not only to segment more accurately but also, as a consequence, affords the ability to determine two similar groups and use one as a control, in the scientific sense, against which to test anything from a new slogan to the effectiveness of a marketing channel, even a casting decision. Experiments have been conducted into the propensity of opera donors to give more or less (or at all) when presented with the likelihood of someone matching their donation[12] Such approaches are the stock-in-trade of the born digital business where they are known as A/B Testing.[13] Google, for instance, often runs hundreds of such live experiments per day across its various services. In the context of the arts, NESTA's recent publication, A Culture of Innovation[14], looks, amongst other things, at models of innovation and the measurement of their impact in parts of the arts system.[15]

1.4.5 Innovating new business models and services

There is significant potential for big data to be part of the development of new products and services across the cultural sector. New forms of digital media distribution and engagement are only the most natural area in which a big data approach can be beneficial. In reality, there are many circumstances, from the educational offer of cultural institutions to their opening times or ancillary commercial activities which can benefit from data and the insights it can bring. In other words acting upon the collection of big data, allows for greater experimentation which in turn allows for the innovation and development of new models of operation. Such product development can be incremental to the customer experience of a performance or embedded in the artistic experience itself. In the field of broadcasting, for instance, we are beginning to see new products such as social TV programme guides[16] and integrated announcements of big data in quiz shows[17] and many more will follow.

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12 http://www.homepages.ucl.ac.uk/~uctpimr/research/opera_matching.pdf

13 http://www.smashingmagazine.com/2010/06/24/the-ultimate-guide-to-a-b-testing/

14http://www.nesta.org.uk/areas_of_work/creative_economy/assets/features/culture_of_innovation

15 http://www.nesta.org.uk/publications/reports/assets/features/culture_of_innovation

16 http://zeebox.com/uk/

17 See for example The Million Pound Drop programme where the presenter regularly compares audience responses to questions to those of the studio participants.

1.5 Deciding what data to use

The first and, in some ways, most difficult question concerns what should be measured. Not only is there much more data than ever before about things that have traditionally been measured, but it is also becoming possible to measure new things. The quantities of available data and increasingly sophisticated analytics software are opening up areas which have traditionally been the preserve of focus groups and surveys to large-scale analytics. Many software programmes already exist to map the connections and activity in online social networks[18], of which Facebook's new (at the time of writing) Social Graph[19] tool is probably the acme. Such tools can identify not just the membership of personal social networks but also groupings of behaviour or opinion and, crucially, monitor changes in it in close to real time. They seek, for instance, to understand the feelings of social networkers towards a particular brand by analyzing what they say to each other in their interactions.[20] In the field of culture, how might these tools be applied to, for instance, the traditional marketing and sales tasks to reduce costs and increase effectiveness? What are the necessary foundations which an organisation needs to have in place to make this possible?

Culture 24's Action Research Project, Let's Get Real, (amongst others) worked with a committed group of arts and cultural organisations to survey their approaches to digital measurement, widely defined, and to the tools which they used.[21] The project goes some way to answering these questions. Projects such as this are a valuable start but unleashing the potential of big data requires a systemic approach across the whole sector.

18 Klout, Twittercounter and many others

19 http://www.bbc.co.uk/news/technology-21032506

20 See Appendix

21 http://weareculture24.org.uk/projects/action-research/how-to-evaluate-success-online/

Chapter 2: Why the way we think about investment matters

Big data can do much more than improve the accountability of public funds.

However, to truly understand the benefits which improved use of data could bring, we need to understand more about the narrative of both investment and subsidy which pervades the cultural system and the effects of this narrative on the rationale for the collection of data today. Historically, the arts were mainly funded through private patronage. This has gradually evolved into various forms of state involvement mixed with market provision. A complex interplay has developed over time.

Similarly, the policy story of UK broadcasting has largely evolved from state provision via the BBC into a mixed narrative relying on a balance between public service broadcasting, recently generally characterised around the concept of overcoming of market failure, and the commercial marketplace.

For these historical reasons coupled with the prevailing political reality, many of our cultural, artistic and broadcasting institutions and activities exist in a context of constant or at least regular reapplication for funds. Many perceive "their" funding to be under constant threat and correspondingly a somewhat self-defensive culture exists.

This is not to say that cultural activity should, by right or peculiar intrinsic characteristics, be held any less accountable than any other publicly funded projects. As Hasan Bakhshi has written[22] "traditional economic approaches to culture which suggest that all aspects of the value of culture can be measured using the tools of market and public economics perpetuate the subsidy culture (in fact, such approaches believe public funding for culture are only justified IF markets fail). In contrast, broader approaches (such as cultural economics), which include economic valuations but in addition value concepts embracing a cultural discourse, do not accept that all values can be measured. Arguably therefore they support more open-ended behaviours of the sort that are associated with entrepreneurialism."

Another way of describing this would be to assert that the subsidy model tends to trap many cultural organisations in a survivalist, financial mindset and that, in turn, this makes it difficult to adopt an expansive, entrepreneurial perspective when under regular implied threat by accountability. To properly harness the potential of big data, this set of underpinning

22 To the author

assumptions needs to change - although it will, eventually, be difficult to determine cause from effect if this shift is successful as one (investment culture) relies on and mutually reinforces the other (use of big data).

It is worth noting that much official discourse on policy relating to the cultural sector in the UK already makes liberal use of the language of investment. To take one example, Arts Council England's recent ten-year strategy, Achieving Great Art for Everyone[23], uses the term "investment" itself no less than twenty-one times. However, there is a considerable mismatch between this use of terminology and the reality of how commercial investment actually works. This difference strikes at the root of what a culture of investment really means. Too often, "investment" is used as a synonym for "subsidy" and this linguistic sleight of hand is, in fact, sometimes harmful.

So what is the difference between subsidy and investment? The issue is not one of the technicalities of measurement, nor of whether the benefits of art and culture can ever be measured with (mainly) economic tools[24]. The matter in hand is whether return on investment, of whatever kind, economic or social or both, is adequately measured at all by current approaches. The research conducted for this paper[25] suggests that it is not, at least when seen in the light of the possibilities of big data.

A culture of investment has as a logical corollary, namely a culture of **return on investment** and, by association, at least some notion that decisions about future funding will be made in the light of that return on investment. Whilst the language of public policy revolves around the notion of investment, the practicality is somewhat different. Resource allocation decisions are clearly made on the basis of a variety of measures, including quantification of output, attendance and audience reach but hard data, particularly concerning impact in addition to output is still too small a component of this decision-making. This, in turn, undermines the potential to use new big data techniques to cast fresh light on areas of cultural activity which have traditionally been difficult to measure but are now coming within the ambit of measurement (see the later discussion on social capital and social networks in sections 3.1 and 3.2).

23 http://www.artscouncil.org.uk/media/uploads/achieving_great_art_for_everyone.pdf

24 See section 2.2 on cultural value below.

25 See bibliography

2.1 Investment or subsidy?

The first issue is that, by and large, the debate often starts from too limited a view of what should be expected from public money in the first place; in other words from too narrow a concept of value. The words used to describe public funding of culture are indicative of the issue. In the arts, public money is most usually characterised as "subsidy". This is a loaded term which indicates an in-built power relationship. "Subsidy" is given to something which is weak. Conversely, "investment" is something from which we expect returns and which is thus imbued with potential. This is a more positive framing of the activity, even though the amount of money spent could well be the same. Framing public investment in culture as "subsidy" positions it as a weak, dependent activity. This is the dominant narrative frame of the arts and it positions them as economically failed, dependent, and difficult.

Likewise, much of the debate around the funding of the BBC, which is often led by commercial critics, focusses on the "taxation" of the Licence Fee and the BBC's possibility for negative impact on markets rather than on the positive public value which the BBC creates. In recent years, BBC policy itself - faced with a hurried and much-reduced settlement of the BBC Licence Fee in 2010 in an environment of public sector cuts and austerity - has somewhat lost the momentum of earlier attempts to define the public value which it creates, notwithstanding recent attempts to measure the positive economic multiplier effects it creates.[26] This has led in turn to a return to a debate principally about the costs of public service broadcasting rather than a modern, critical assessment of the benefits and value set against those costs.

An entrepreneurial point of view sees the investment of funds as a source of risk capital, tied to the delivery of certain outcomes, usually financial return on investment. Additionally, it feels very different to be an investee than it does to be in receipt of subsidy. An investee wants to know themselves how well (or badly) things are going because they share incentives which are clearly aligned with those of investors. When in harmony, investor and investee should be committed to achieving the same ends.

In those circumstances knowing about and dealing with success and failure on a daily basis take on a different complexion. This is not, of course, to say that cultural institutions or those who work and volunteer in them lack commitment or that they duck criticism. Indeed, many cultural organisations face significant criticism as a fact of life every day. But it is self-evident that constructive criticism from people who share your objectives is different to the shadow of accountability culture.

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26 BBC (2004) Building Public Value: Renewing the BBC for a digital world http://downloads.bbc.co.uk/aboutthebbc/policies/pdf/bpv.pdf

Of course, the outcomes which are required of public funds should rightly differ from those of a commercial investment. Whilst there are always essential financial considerations to be factored in, investment in culture should also have the public good at its heart. Whilst economics as a discipline is more than capable of encompassing both financial and non-financial (e.g. public good) as outcomes, the subsidy culture has encouraged a focus on the financial above all. The public good component of cultural activity is more difficult to measure - to the non-specialist at least - and much more difficult to communicate.

2.2 Cultural Value

For too long, a purely economically-orientated model, using money as the measure of value, has been the only game in town for policymakers and funders alike when discussing the public value of cultural investment. Whilst it has been relatively easy to understand the cost side of the equation of cultural funding, it has been much more difficult to quantify the value and benefits in purely financial terms.

The notion of cultural value, which is central to this paper, moves beyond polarised arguments and offers an opportunity to begin to measure both the economic benefits and those such as the formation and reinforcement of social and cultural capital which also arise from cultural activity. As such, it follows the tradition of cultural economists including David Throsby, Victor Ginsburgh and Bruno Frey who emphasise the need for both economic and non-economic indicators to achieve a full account of the value of culture.

Implicit in this approach is a rebalancing of what is measured so that it includes more criteria which indicate impact and audience activity resulting from cultural investment as well tracking the production of that activity itself. The current model of measurement, focused as it is on accountability, knows a great deal about what is produced and not so much about its consumption or impact. This is ripe for and able to change. Towards the end of this paper, we will discuss the potential of social media analytics to give us new perspectives on the question of social capital formation and cultural value. For now, however, we return to the use of data in the cultural sector as a differentiator or unique selling proposition (USP) as a key precursor to that argument.

2.3 Big Data and Cultural Value

By coupling data-driven thinking and the use of advanced tools for the measurement of, for instance the effectiveness of advertising, PR or other communications activities, a revolution

in the effectiveness of culture institutions in achieving impact and delivering cultural value, perhaps better thought of as their overall cultural aim, could be achieved. For the purposes of this project, the most salient and possibly even the original definitions of cultural value stem from John Holden's 2004 publication for Demos, Capturing Cultural Value[27]. In this work, Holden explores in detail the need for a new approach to the value of culture. He provides a framework for thinking about cultural value which has three elements: instrumental value, intrinsic value and institutional value.

There is an extensive literature around the definition and indeed the usefulness of the concept of cultural value[28] much of which is referenced in the bibliography to this report. It is perhaps most easily thought of as a way of understanding how well arts and cultural organisations deliver against their core missions as a part of wider society as a whole. See section 1.9 below for a more in-depth discussion of cultural value.

Measuring cultural value with any kind of objective accuracy has been, and continues to be, both controversial and difficult. This is not least because it is easier to measure the instrumental benefits and, according to some at least, impossible, for many and varied reasons, to measure the intrinsic value of art itself. The debate is well summed up in the following research abstract as:-

"Over the years, political pressures have prompted arts supporters to emphasize that the public value of the arts lies in their contribution to broad social and economic goals, such as economic growth and improved student performance. This study urges a new approach that recognizes how both instrumental and intrinsic benefits of the arts contribute to the public realm."[29]

A big data approach holds out potential to measure this kind of value more effectively than ever before and thus could change both the ability of individual cultural organisations to understand and present the cultural value they create, as well as that of their funders.

27 http://www.demos.co.uk/files/CapturingCulturalValue.pdf

28 See bibliography

29 McCarthy, F et al. (2005) Gifts of the Muse: Reframing the Debate About the Benefits of the Arts RAND

2.4 Big Data as a tool for cultural and regulatory policy

Many forms and large quantities of data are already brought into the policymaking and regulatory context for most industries and the cultural sector is no exception. Cultural activity has as one of its primary objectives, explicit or otherwise, the creation of social capital. As more and more people use social networks the size of the potential data set becomes increasingly interesting. More significantly, as they use those networks to express and discuss cultural and artistic topics and opinions, the relevance of what is happening on social networks to the sector is increasing. This could lead, indeed some would say is already leading, to the possibility to apply new forms of measure - specifically the measurement of cultural value - to this social media activity. Current and likely advances in the measurement of digital social network behaviour may soon start to point the way towards new additions to the traditional, heavily economically-oriented toolkit. They may provide us with an improved, albeit still imperfect, way to get more of a grip on the sometimes slippery notion of cultural value. This can only be a useful development, although much further work will be required. Indeed, if big data can be used to track the most influential nineteenth century authors, as Macroanalysis, a recent work by Matthew L. Jockers suggests[30] then much more than traditional data analysis is becoming possible.

There is a significant opportunity here for organisations such as Arts Council England and Nesta to lead the way by reforming their own use of data and their expectations of funded organisations. In addition, regulators such as OfCOM should look to embrace new approaches to data in their evidence-based processes in the content arena.

30 http://www.press.uillinois.edu/books/catalog/88wba3wn9780252037528.html

Chapter 3: Beyond Accountability: Data as a USP

More data and measurement are not, by themselves, a solution to any particular problem. The potential for more data can, in some contexts, even become debilitating, especially if it is collected for the wrong reasons, in an inefficient way, poorly analysed or not acted upon.

The approach that is taken to measurement is essential. The rationale is crucial. The key question is to consider why cultural institutions need to improve their measurement and the context in which the data needs to sit for it to have an impact.

As discussed above, data and information are most often used in arts and cultural settings somewhat passively, mainly to satisfy the needs of accountability. The necessary change consists of a migration from this model towards thinking of data as an active asset to be used in the operational and strategic management of the organisation and also as a tool for better, faster, more responsive governance and regulation.

This is not the first thing that leaps to mind in much of the cultural sector when discussion turns to KPIs (key performance indicators) or even attendee data analysis. The sector exists in a context of a narrative of subsidy and market failure which means that measurement is too often seen as a burden, placed on defensively-minded organisations as a form of accountability. Naturally this sometimes leads to the exaggeration of success and the downplaying of failure. The advent of big data affords the possibility of bringing fresh light onto everything from the renewal of funding to the status of something as large as public service broadcasting in our culture. This light should be as non-partisan as possible. As we are learning from the emergence of data journalism, the data can often tell the story surprisingly well.[31]

The concept of data as an organisational asset and the mindset which makes that possible are totally different. A good exemplar of an organisation which is well on the journey to this mixed approach might be Channel 4 whose public ownership and commercial milieu could make it ripe to act as a standard-bearer for new big data approaches to public investment.

This model aims to encourage organisations to use data as a positive force. Identical measurements, when applied by organisations with an investment mindset and using new "big data" techniques to go beyond measuring simply financial outcomes or ticking the boxes

31 http://www.guardian.co.uk/news/datablog

on a funding application, can be used to learn from real experience of what works and what doesn't.

To some degree there is a risk of circularity in this. Does the mindset need to change to reap the rewards of data - or can data change the mindset? Of course, in practice, the two are inextricably linked. Someone or something, however, needs to take the first step.

Today's economic situation is providing even greater impetus for many organisations to use every available tool to reach audiences. Likewise, funders in particular have a responsibility to adopt these approaches and measures to ensure the public value of their expenditure. In reality, the adoption of big data techniques by early adopters will continue, but its systemic acceptance is likely to require a certain amount of "pull" on behalf of funders and even regulators. They can make this possible by changing their data requirements of funded and bodies.

3.1 Data-driven decision-making

The final piece of the jigsaw is the need to act on data - so-called "data driven decision-making" (or DDD)[32]. A recent but well-respected study by the academic originator of the concept of the "long tail", Erik Brynjolfsson, albeit outside the arts context, has shown that commercial organisations which have adopted DDD can have output that is 5-6% higher than would otherwise have been expected. A more recent business study for NESTA shows how a small but significant group of UK companies (The Datavores) are already making sophisticated use of data to drive decisions and, more importantly, seeing benefits from doing so.[33] There is no logical reason why such benefits, if more widely proven in later studies, should not be seen by cultural organisations. The impact on the arts and culture sectors, with their benefits going beyond the economic, could perhaps be even greater.

There is little published research so far into the effects of big data and much less into the effects of social data on the formation of social capital (See Appendix) Cultural research funding bodies such as the AHRC should be urgently looking to improve this situation.

32 Brynjolfsson, E et al. (2011) Strength in Numbers: How Does Data-Driven Decisionmaking Affect Firm Performance? (http://dx.doi.org/10.2139/ssrn.1819486)

33 Bakhshi, H & Mateos-Garcia, J. (2012) The Rise of Datavores NESTA http://www.nesta.org.uk/home1/assets/features/rise_of_the_datavores_report

It is the responsibility of policymakers, boards of trustees and arts leaders to make the most of the public funds which they are employing, and to do this without making the most of the available evidence is both unnecessary and unacceptable. However, the creation of a culture of data-driven decision-making will take time, strategic leadership and skills development.

It is also essential that the benefits of big data are made available to the public not just in economic efficiency but also in the creation of new products and forms of public and cultural value. In a world where the bookshop now recommends what you might like to read, your social network knows more about you than your bank, and personalised products and experiences are more and more the norm, the culture sector has the opportunity to innovate and to stay in, or even ahead of, the game.

Broadcasters, for instance, are already aware of the risk to their livelihood from other organisations, such as search providers, video-on-demand platforms and social networks, which are increasingly owning the relationship with, and data about, the user. This poses central risks to the commercial model of many broadcasters, who rely on advertising. It is likely to be a central commercial (and possibly regulatory) battleground of the future as the ownership or control of this relationship directly affects advertising revenues.

Innovation is already occurring in the development of new arts and cultural experiences which are in harmony with the digital times. Projects such as The Space and Arts Council England/NESTA's investments in Digital R&D are leading with the way, but there is also a long history of leading-edge arts and culture organisations creating and presenting digitally-orientated work. This trend should, of course, be encouraged to continue and, where possible, meaningful and effective data strategies should be an integral part of new proposals to those or similar schemes.

There is no reason why public cultural institutions cannot turn data and measurement to their advantage. How much more powerful could a cultural institution's offer to a potential sponsor become if, for instance, it were possible to more closely understand and connect to the sponsor's desired audience and to be able to prove that to be the case? As commercial use of data from loyalty cards, and social networks increases, the cultural sector has an opportunity to strengthen its position in parallel.

Encouraging data-driven decision-making is equally as challenging in this field as it is in regular, non-digital activity. Decision-makers often have little experience of or aptitude for data of this kind, or indeed any other beyond the baldly financial. This can lead to poor strategies concerning what, if any, data to collect as well as limiting the extent or efficacy of

action which might be taken on the basis of any data which is collected. The following principles are useful:-

- Data use should be driven by a desire to influence specific outcomes, not for its own sake or purely because of the need to be accountable
- Reporting data is not the same as analysing it
- Data should be used proactively wherever possible
- A culture of HIPPOs (Highest Paid Person's Opinion) is likely to struggle to become data-driven as there is too often an unwillingness on the part of very opinionated leaders to be influenced by others - and a reticence on the part of others to challenge them - no matter how compelling the facts might be.
- Ownership of the analytics process should be with the person who understands it most and is most passionate about it but engagement with it should be across the whole organisation.

An interesting example of an arts organisation which has been travelling the road to data driven decision-making is the Tate.

DEVELOPING AN APPROACH TO ANALYTICS - THE TATE

In their excellent paper, Making Sense of the Numbers, A Journey of Spreading the Analytics Culture at Tate1, Elena Villaespesa and Tijana Tasich explore the journey that the Tate galleries have been on to develop their base of data from across the organisation and to begin the journey to embed a culture of data-driven decision-making in the institution. They say "In most cases, museums stumble blindly into the world of analytics, and at first see metrics reporting as a peripheral activity, largely undertaken without a plan or dedicated resources. They thus miss the opportunity to fully understand the deep insights analytics can offer." By employing what is described as an "Analytics Maturity Model" (see diagram below) Tate has been able to plot a strategic path towards a more analytical organisational culture and, crucially, to measure progress along the way.

The project began from four strategic questions which were then used to construct a web analytics maturity framework the better to understand a strategy for web analytics and to measure progress (see below).

The questions were:-

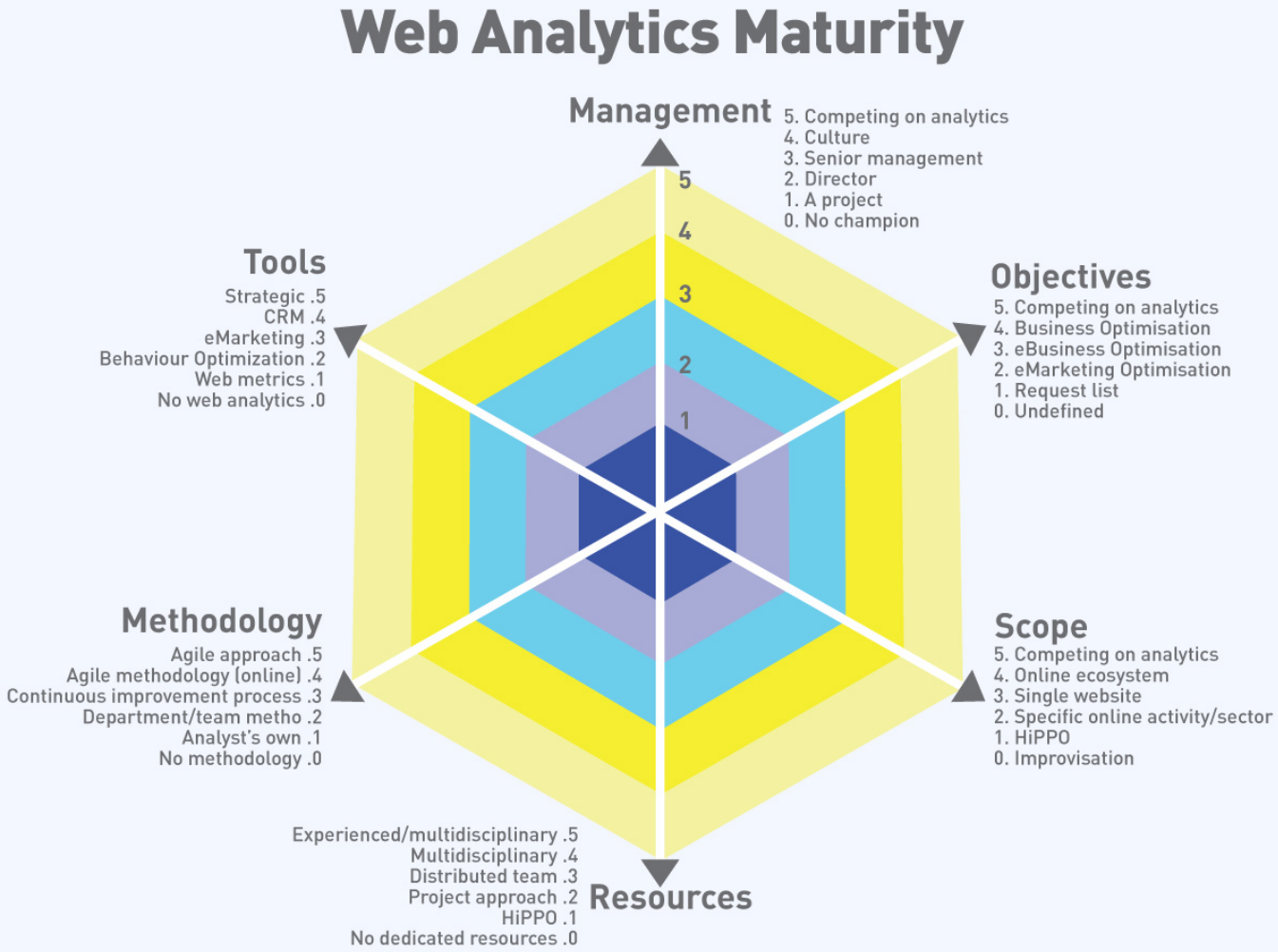
- WHAT PURPOSE WOULD YOU LIKE THE ANALYTICS TO SERVE IN YOUR ORGANISATION?
- HAVE YOU GOT A CLEAR STRATEGY AND CLEAR OBJECTIVES?
- WHAT WOULD BE THE MOST EFFICIENT WAY OF SETTING UP THE GOVERNANCE AND OWNERSHIP OF THE ANALYTICS IN YOUR ORGANISATION?
- HOW WILL YOU SET UP PROCESSES TO MAKE SURE THE ANALYTICS BECOME INTEGRATED INTO THE ORGANISATIONAL CULTURE?

The project is already clearly leading to meaningful strategic change with real impact as can be seen from the sample information dashboard which was produced for one of Tate's exhibitions (see below).

The team is already reporting significant engagement at senior levels as positive results are seen including but not limited to investment decisions around digital activity.

TATE

DEVELOPING AN APPROACH TO ANALYTICS - THE TATE



TATE

3.3 Data Protection and Privacy

There are data protection and privacy questions to be aware of in all of this. Indeed, a consistent response of the public to the increased "datafication" of daily life involves concerns over data security, identity theft, privacy and the question of minors.[35] It should be a key role of publicly-funded cultural institutions, which often have higher trust ratings than purely commercial entities, to lead the way on such questions. By setting standards and best practice, as well as by training and improving capacity amongst their constituency, they could have a catalytic effect. To a certain extent, what Channel 4 is already doing with its approach to customer data and such efforts should be applauded, reinforced and extended (see box below).

35 http://stakeholders.ofcom.org.uk/market-data-research/media-literacy/archive/medlitpub/medlitpubrss/socialnetworking/summary/

CHANNEL 4 - DATA AS THE NEW OIL

In many ways, C4 has led the way amongst UK broadcasters in its use of interactive digital media. From Big Brother via the award-winning user-generated site, FourDocs, to the successes of its education and multiplatform departments in a variety of PSB genres, software projects from 4iP and more, Channel 4 has often been highly innovative. And underpinning this has been a gradual but continuing shift in its core business of TV programmes.

As more and more viewing is time-shifted, TV has developed a portfolio of traditional channels to hedge against changing viewing patterns, so far largely successfully. But at the time of writing, the organisation, which now has a remit across multiple platforms, has embarked upon perhaps the biggest strategic shift in its relationship to the audience that it has yet undergone.

THE PROBLEM

As a publisher broadcaster which commissions independent producers who own the intellectual property rights to the shows, C4 faces challenges unique in the UK as content becomes available across more and more channels. This uniqueness stems both from the mixed model of public ownership and commercial milieu and from the fact that, as a publisher broadcaster, C4 does not hold the rights to the shows which it commissions. C4's core business model remains advertising and the shape of the advertising market is changing. Search and social networks have fundamentally changed the market in a relatively short time and each of them poses challenges to C4 whose traditional model for online display advertising is under threat as personalised advertising continues to gather pace and content spreads out across the network via new distributors, ad networks and syndicators. Likewise, the emergence of video and on-demand players including on mobile and set-top boxes could further erode the Channel's offer to its advertising clients. In short, other people are encroaching on the channel's traditional relationship to its audience and are in danger of knowing more about them than C4 does and, thus, shifting value to themselves and away from the Channel's bottom line. Whether this is Facebook or Google, there is no denying that "born digital" organisations are faster to the mark when it comes to exploiting big data and have significantly greater resources at their disposal.

THE SOLUTION

C4's main strategic response to these questions has been to step up its own approach to big data very significantly. Following a key note speech by CEO, David Abraham in 2011, wherein he referred to data as "the new oil", the Channel, under Jon Gisby and latterly Gill Whitehead, has been ramping up its collection of Data (Data 1.0) and linking together as many sources of data as it can (Data 2.0). At the time of writing, the service now has over six million registered users, up from little more than ten per cent of that within less than two years. Indeed, one in three 16-24 year olds in the UK is registered. And the users are very regular visitors. Sixty per cent of all programmes viewed on 4OD, the Channel's own VOD service, are now viewed by logged in users - up from a tiny proportion only one year ago. The Channel's challenge, which it is facing with energy, is is to keep building this database, to develop the skills and resources to analyse it meaningfully and rapidly and then to act on what is learned.

In the field of social media (Data 3.0) the Channel has conducted a number of isolated experiments with key shows - both creative and strategic - and now thinks hard about the way in which, for instance, material

aired early in an episode might be used to drive social media buzz which in turn has been seen to feedback into larger, possibly more engaged audiences. In addition, whole cross-platform formats are being developed - such as Embarrassing Bodies and, to a lesser extent, The Million Pound Drop - which combine social media insights with the convening power of broadcast television to unusual and considerable effect. It will be fascinating to watch as a more systematic approach to these questions develops over time and as the various data sources start to cohere.

Simultaneously, C4 is continuing its work to use behavioural insights to help develop and improve products including personalisation tools to tailor the individual viewers experience and whole new elements of the core digital media product set such as so-called twin-screen interaction between tablets/mobile devices and TVs, or even smart TVs. In this way, a data-driven approach is also becoming a key contributor, as it does with so many "born digital" companies, to the development and refinement of products themselves.

Chapter 4: Social Capital Formation and Cultural Value

We also looked at current social media analytics tools with a view to considering their potential to contribute to the perennial debate about the value of cultural investment (see Appendix). The loose hypothesis that "social data"[36] could conceivably inform an understanding of the formation of social capital, appears to be borne out, at least at the theoretical level, by emerging disciplines such as value network analysis and behavioural and evolutionary economics, disciplines which, amongst others, could bring much to the field of big data analytics in the next few years.

Social capital formation, a key constituent of the idea of cultural value, is a central benefit of cultural activity, although, it is, itself, subject to a variety of definitions. Many arts and cultural organisations have been using the language of social capital - arguing that they contribute to social cohesion, identity, education and much else besides for some time. Coupled with more instrumental arguments about the benefits of artistic work to everything from mental health to minority awareness and much else besides, discussions of the benefits of social capital have been a feature of the arts and broadcasting policy landscapes - in more or less explicit form - for much of the last fifty years. So what of social capital?

4.1 Measuring social capital: the theory

If a key component of the value of culture lies in its intrinsic ability to generate valuable experiences, emotions and connections - as is argued by this paper - and if this value can be measured then a profound new dimension could be added to the debate around cultural investment. Whilst it is still early days for this approach and much work will be done, rapidly, in coming years, the initial signs coming from experimentation on the measurement of social networks are very promising. But what is the new target of measurement? What is the definition of social capital?

In 1916, L.J. Hanifan, the originator of the term, suggested it was as follows:-

"I do not refer to real estate, or to personal property or to cold cash, but rather to that in life which tends to make these tangible substances count for most in the daily lives of

36 Social data is conceived as the increasing ability to gather large-scale data about such things as sentiment, the capability to map the "social graph" of individuals and groups with increasing degrees of refinement and, most significantly, the capacity to map such trends over time. Naturally, in such a rapidly moving field it is impossible to form a tight, eternal definition.

people, namely, goodwill, fellowship, mutual sympathy and social intercourse among a group of individuals and families who make up a social unit..."

Much of the work in the field over succeeding years has concentrated on the way in which groups, networks and communities are formed or broken down and the reasons why they thrive or fail. Pierre Bourdieu's work in the 1970s[37] began to draw distinctions between social capital and what he termed "cultural, economic and symbolic capital". Discussion of the underlying concepts of social capital has, been a staple of philosophy and sociology since long before the term was coined. There is little that fascinates the average human more than social relationships and hierarchy. In addition, leading-edge neuroscience is starting to uncover the evolutionary basis of much of this field, as with so many others.

Perhaps the most well-known explicit exposition of the concepts of social capital came in Robert Putnam's Bowling Alone[38] which laid down what he saw as the breakdown of civic participation in American society and explored both the explanations for that phenomenon in so far as it existed and measures which might be taken to deal with it.

The Harvard Social Capital Benchmark Survey provides a set of eleven different facets of social capital ranging from trust, diversity of friendships and informal socialising to volunteering and giving.[39] Using digital analytics it is becoming increasingly possible at least to track the digital traces of some or all of these behaviours and, where they are instantiated explicitly in the digital sphere, even to trigger or build on them directly. This field will continue to evolve rapidly and for good reason; the technologies and behaviours on which it can be brought to bear are so all pervasive in many countries and cultures and developing so rapidly.

Recently, an extensive literature has sprung up covering the changes to social structures which are coming about as a result of increasingly personal, pervasive digital networks and our use of them to communicate amongst ourselves at the level of individuals and informal groups. This shift is having a fundamental effect on some aspects of human behaviour - and on the stock market valuation of the companies making much of it possible - and there are as many views of the pros and cons of this as there are writers.[40] It is encouraging therefore that

37 Bourdieu, Pierre. (1972) Outline of a Theory of Practice Cambridge University Press

38 Putnam, Robert. (2000), Bowling Alone: The Collapse and Revival of American Community Simon and Schuster

39 http://www.hks.harvard.edu/saguaro/communitysurvey/results5.html

40 See bibliography for some examples.

some governments, including the US, though not the UK are attempting to measure social capital in their Current British Population Survey[41].

Regardless of whether these developments are seen to be positive or negative, it is undeniable that something is happening and that its effects can be felt in the non-digital world. Perhaps the ultimate expression of this to date has been the use of social networks to facilitate the uprisings of the Arab Spring and the complex and emergent way in which information on communications networks fed both the events themselves and worldwide understanding of and reaction to them. It seems that in some circumstances at least, digital behaviours can have profound effects in the real domain. Indeed, many consider the commonly used divide between the real and the virtual to be increasingly meaningless[42] given the scale of use of digital technologies, in particular mobile smartphones, tablets and apps which have changed the context of digital behaviour beyond all recognition in the last five years or less.

Much of the debate about the "value of the arts" nods towards this widely defined social capital benefit, but it is acknowledged to be difficult both to specify and to measure. We have explored the landscape and believe that there is potential for improved public value from the use of social data in the context of the cultural sector.

As discussed above, the hypothesis of this project was that leading-edge social network analytics might be a fertile breeding ground for new analytical techniques which would allow improved tracking of cultural value through the social capital formation afforded by publicly-funded cultural activity. There are grounds for optimism from the study but a seeming lack of sectoral readiness to test the theory in practice mainly for the structural reasons already described. To be ready to take advantage of this potential, individual organisations, funders and regulators would need to be close to Data 3.0 status - which is currently very much the exception rather than the rule.

41 http://www.thebps.co.uk/

42 Rogers, R. (2009) The End of the Virtual - Digital Methods - http://www.govcom.org/rogers_paris_medialab.pdf

THE STRUCTURE OF NETWORKS

The route that anything takes from node to node via links (or connections) is referred to as the path and can be illustrated by way of a graph. A graph is a way of diagramatically illustrating the structure of a complex network. This concept is popularly most discussed in the notion of the social graph, which has been referredto as a "**global mapping of everybody and how they're connected.**"1 The social graph, in turn, is a variety of data visualisation. In turn, connectivity is a way of measuring whether and how densely the nodes on a graph are joined together.

It is by counting and measuring the number of nodes, the way in which they are linked and the degree of connectivity that arises from this that most analysis of the value of social networks - both "real" and digital - begins. This is the art and science of network topology.

4.2 Measuring social capital in digital networks

In broad terms, the measurement of social networking activity is structured around the twin poles of influence and meaning. There are literally hundreds of start-ups, as well as established companies, competing with services in this field, and more are joining every day.[43] The prime motivation for this activity is the desire of users, principally paying corporate users or the businesses such as PR agencies which work with them, to understand better their position in social networks. The objectives are usually to outshine their competitors and to influence and then measure the success or otherwise of their specific social media activity whether measured at the level of individual tweets/updates or used more broadly to gather data about campaigns, topics or interest.

The measurement of influence is based on the principles of network value discussed above. Services such as Klout and Kred combine together, in a proprietary way, data which can be mined from a user's social graph and activity on social networks (in this case principally Twitter) to give users a score (or scores). This score usually combines some combination of the number of followers/friends, the relative connectedness of those individuals, the frequency of social media activity and the level at which that activity is taken up by others and amplified - a proxy for "interestingness". Many such services provide a variety of ratings for their users in relation to these dimensions. Some also categorise their users into broad types based on an analysis of the figures overall.

Other services, such as TweetReach give detailed data on the reach of individual tweets which allows the tracking of their spread. Still other services, including from Facebook, Google, Adobe and many other big players, look to combine both aspects of social media analytics (and other more traditional analytics data such as traffic clickstream analysis) to provide dashboards of a variety of measures. The Sonar Framework from London's Trampoline Systems is a good example of an innovative approach to social analytics for businesses not least in the way in which it combines deep understanding and manipulation of data with visual approaches to information design and presentation.

In practical terms, as with much else in the field, a graduated approach to engaging with this space is likely to be the most feasible model for most cultural organisations. This is explored below. By first dipping their toe into social analytics with relatively general purpose tools such as Klout or by following their social media statistics with HootSuite it is possible for them to

43 See Appendix B for information on digital measurement tools

get a feel for the territory. It can be quite addictive but, as the Tate have found, the journey to social analytics maturity consists of several linked components.

4.3 The graduated approach: from hits to likes, to links to impact

As with so much else, the essential component of a sensible approach to social analytics is the question of what to measure. It is relatively easy to agree on objective measures of reach such as Facebook "Likes" or Twitter followers. What is less easy to be sure of is whether these measures are actually indicative of any actual, measureable specific impact, particularly in the long term. This is not an argument for not measuring them, but rather a warning not to rely on them overmuch without further thought, tempting though that may be. It is important that decision-makers do not simply fall into the trap of assuming that high numbers of such indicators are, of themselves, indicative of achievement and impact. After all, how many Twitter followers is enough?

Of greater value is tracking the change rates and trends in these statistics of objective measures of reach over time and seeking to understand what drives the change. However, this in turn, is only the beginning of the possibilities. For the cultural sector to more actively be able to measure, report and act on this data, it needs to link to organisational or sectoral priorities. The first step to this, described above, is to connect social media activity to specific measurable outcomes such as ticket sales. This is an essential prerequisite of a meaningful strategic approach (Data 3.0 status). But to truly uncover the latent social capital creation which lies at the heart of the notion of cultural value used in this report, it is essential to go much further.

At the level of individual projects, it will become increasingly essential to imagine a set of assessment criteria and search terms which can be used to track social impact on an ongoing basis, in the way that Google Insights for Search makes possible. For instance, an education project might agree a set often criteria or search terms and track these in addition to the specific names of the project, the organisation, the key participants etc through a dashboard of measures which would also be combined with hard data from CRM systems wherever possible. Long-term tracking of an organisation's impact is also crucial and, indeed, may be slightly easier to configure as some insight will be gained even from tracking of a few high level variables - although assessment criteria will need to be kept under regular review. Again, a dashboard of measures will be essential.

At a higher level of abstraction still, funding bodies will need to agree upon a set of criteria which reflect the dimensions of social capital with which they are most concerned. There are likely to be nested hierarchies of such criteria, some very general, some more specific, which need to be brought together. The precise mix will be the subject of constant experimentation although some constancy is to be desired to allow longitudinal measures wherever possible. Also, given the ephemeral nature of much social media activity, mechanisms will need to be deployed to capture the ongoing story over time and to report back on it. The critical requirement is to establish targets for measurement as early as possible, set the parameters and then, so far as this can be achieved in practice, to stick to the "what" of measurement even as the "how" and the "how much" continue to change, as they surely will.

Policymakers might wish to set guidelines or at the very least provide open access to their own criteria of assessment to incentivise the cultural sector more widely to engage with these approaches. This will in turn assist with sectoral reporting and decision-making and is part of the recommendations for strategic approaches made in the final section of this paper. It could also play an important part in resetting the views of measurement sceptics who are conditioned by the world of data being used only as a tool of accountability. Funders and strategic bodies have a key role in both setting the tone and in building the capacity of the sector to understand this new world.

The field of social analytics is fertile territory and is already providing evidence of previously latent or difficult to measure variables becoming more measurable. In the world of brand management, indices exist which respond in real time to semantic analysis of social media activity online and give an update to marketers and executives in the commercial world. Whilst these tools are mainly being developed (for instance by PR agencies such as Edelman)[44] as tools to combine the possibility of influencing social networking activity with tracking it for awareness purposes, the potential is significant.

Probably the best known area of social analytics moving beyond the basic understanding of traffic, linkage and the social graph in general is co-called sentiment analysis. The aim of this field is to understand the subjective, often emotional, content of text, usually online material such as forum or social network posts or blogs. The techniques involve include the use of natural language processing and various methods for rating and scoring the emotional implications of the use of certain words in the text. Everyone from commercial brands and political strategists to advertising agencies and media regulators[45] and anti-bullying

44 http://eprints.soton.ac.uk/335268/1/wk10p14-tinati.pdf

45 Holtzman, N. et al. (2011) Exploring media bias with semantic analysis tools: validation of the Contrast Analysis of Semantic Similarity, in Behav Res Methods. 2011 Mar;43(1):193-200 http://www.ncbi.nlm.nih.gov/pubmed/21287121

campaigns are interested in the results of this field[46]. For arts and cultural organisations the potential is twofold. Firstly, at the simple level of better audience understanding, the use of simple semantic analysis tools such as Roistr[47] will help to bring such information to many organisations. As time goes on, the work of particular academics such as Deb Roy, Director of the Cognitive Machines Group at MIT who, amongst other things, is researching the mapping of concepts as they spread out online[48], from a base in natural language research, will become highly relevant to understanding the impact of arts and cultural activity. There is a clear alignment of interest between commercial brands and public services in the development of this research to better inform understanding of online behaviour.

Lessons are also being learned (see Tate Box-out) concerning how to tell stories about data. This is an essential skill. Indeed, organisations such as Channel 4 are already battling with the challenge of employing enough data scientists to help them analyse and then create strategic narratives around their data. People with such skills are in high demand and are expensive to hire. The cultural sector will need to grow its own approach and people if it is to be able to provide the raw material for stories about an increasingly data-driven model. Afterall, there will always be too much data and too little time. A new form of professional judgement based on more statistical inputs is already beginning to evolve. This is at the core of the processes of many born digital businesses.

In what way could the cultural sector take ownership of this component of the big data revolution? As yet, there are few instances of data visualisation practitioners working in the arts or, indeed, of established artists turning their hands to data visualisation. Surely the time is ripe for both.

46 Chmiel, A. et al. (2011) Negative emotions boost users activity at BBC Forum, in Physica A 390, 2936 (2011), http://arxiv.org/abs/1011.5459

47 http://roistr.com/

48 http://www.ted.com/talks/deb_roy_the_birth_of_a_word.html

Chapter 5: What to do next

In-depth discussions with leaders in the field conducted for this project clearly indicate that the frame of reference for the use of data in the arts and culture is in need of revision, followed by considerable change within the sector. Perhaps the biggest challenge for the cultural sector is to have a mature debate about which criteria are susceptible to the most meaningful measurement. Only a narrative of investment and an expanded, increasingly measurable concept of cultural value provide the best basis for these kinds of analytics. The beginning of this journey is increasingly overdue. Data, where it is considered at all, is most often seen as a duty or a complex problem. Few see it as an asset. There is much to do.

This need not, however, be a daunting task given that many other economic sectors are already some way down a similar road, especially those which are "born digital" such as web and social media businesses themselves. It is essential to learn from these sectors whilst acknowledging the specific circumstances in which many arts and cultural organisations find themselves. In government and policy circles, as much as anywhere else, the challenge will be to move beyond the "data as accountability" paradigm which has often been counter-productive in other parts of the public sector. The opportunity, indeed the necessity, is to see data as an asset which can encourage "subsidised" organisations to think of themselves ever more as investees in a real way which has beneficial effects on their delivery of public value.

5.1 Specific Next Steps

Clearly, not all cultural organisations stand at the same point on the continuum of data-readiness described in this report. As a result, the activity undertaken in pursuit of the recommendations of this report should be graduated to take this into account. It will be important both to take into account their development needs and also to harness the knowledge and capability of some individuals and institutions to act as pathfinders and to help each other along the road.

The paper proposes three strands of work to engage with the "data opportunity".

This paper proposes three strands of work to engage with the "big data opportunity".

1) New Data Strategies

- Cultural organisations, policymakers, funders and regulators should audit their use of data, internally and externally to establish a current baseline.

This baseline should then be benchmarked against "big data" approaches from other sectors.

- A timed strategic action plan should be established against specific milestones with regular periodic reviews of both progress and scope.

- A significant outcome should be the development or refinement of data strategies within cultural organisations themselves.

- From the point of view of funders and regulators, new, big data evaluation metrics and KPIs for (e.g.) funded or regulated organisations - by Arts Council England, OfCOM or others - should be developed and then deployed at the next opportunity (such as an NPO funding round, PSB review etc). A graduated approach may be necessary to take account of the differing levels of data maturity of organisations and their range of commercial models.

- Arts Council England should consider the requirements for the establishment of a UK Arts Data API

2) Pathfinder Projects

- Pathfinder Projects should be set up to explore approaches to data management in the culture sector including assessing the integration of existing data sources, data presentation/visualisation for internal and external use and new forms of measurement.

- Applied R&D activity should be funded to help arts and cultural organizations understand their data 'assets' and systems and to look at the relationship between cultural value/social capital formation and state of the art social media metrics.

- Projects could form part of the NESTA/Arts Council England R&D Fund and/or be funded in partnership with commercial organisations. Future digital investments, such as successors to The Space, have a key role to play in adopting best practice in their own right and also in ensuring that the learning from pathfinder projects and their own commissions is shared.

3) Capacity-building

- Capacity-building projects for policymakers, funders and boards should be established to develop the necessary philosophy and skills to embed a culture of data-driven decision-making at the highest level. This will enable the cultural sector to utilise data in their own operations in the most effective way to promote efficiency and resilience and, in due course, to respond to new requirements for data from the funding organisations and regulators.
- Consideration should be given to the appropriateness and timing of the use of data being a requirement of (e.g.) funding agreements.

- Capacity-building funds from within Arts Council England's Creative Media Strategy could be utilised for this purpose in the short term.

- Thought should be given to how to maximise the impact of investments such as The Space in this capacity-building programme.

These are three suggested routes along the journey to a "big data" approach to culture in the UK. The time to start is now.

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Appendix Two: Technical Experiment

A Big Data Dashboard for the Cultural Sector

As part of the Counting What Counts project, research was undertaken into the practical and technological implications of adopting a big data approach, in particular with reference to the use of social media analytics from a variety of sources alongside more traditional metrics such as box office/visitor statistics. The ultimate objective was to obtain an understanding of the theoretical feasibility of establishing an integrated model (Data 3.0). The main output of this process was the establishment of some level of comfort that the theoretical argument of the wider paper was, in principle, deliverable in practice.

A key part of this work was to establish an understanding of the scoping requirements which such a dashboard would require and to survey briefly the current market provision at the time (Summer 2012). The expectation of this work is that further detailed analysis could be undertaken by funded or commercial organisations as part of the recommended follow-up from this project.

Objectives

A Big Data Dashboard for the Cultural Sector was hypothesized as something which would:-

- Work with and extend existing technology where possible
- Use organisational data but with new technology back-end if necessary
- Show on an ongoing, real-time and customisable basis data such as:-
- Sales trends, return on investment of campaigns
- Integrated social media analytics
- Sentiment concerning individual cultural products, and organisations
- Sentiment and other trends over time
- Algorythm-based suggestions and recommendations for further action
- In doing the above, improve:-
- The resilience of arts and cultural organisations and sectors
- The experience of consumers/citizens
- The delivery of public/cultural value

Users

The potential users for the Big Data Dashboard for Cultural Sector were identified as:-

- Operational staff in sales, marketing, development and other executive roles
- Board members and Trustees
- Funders and policymakers at the aggregate sectoral level
- Arts and cultural funders, policymakers and regulators re their own organisations
- Members of the public - through open accountability and new sectoral level products and services

With these objectives and users in mind, a high level, non-exclusive list of technical requirements was put in place.

Requirements Analysis

Working with colleagues at the University of Ulster, we established the following high level requirements for a big data dashboard for the Cultural Sector.

- Unique user records integrated with core sales and database systems
- Capacity to match with/log-in from social media log-ins/IDs
- Product level tracking and sales tools
- Integrated marketing and messaging capability incl campaign tracking
- Detailed segmentation tools coupled to marketing capabilities
- "Push" social media management capability and tracking
- User-modifiable Keyword-based mention tracking across social networks
- Trend and influencer tracking (incl both in and out of house)
- Data visualisation tools at all levels
- Full data export capability
- Open data model regarding other publicly funded cultural organisations

It became clear very early in the project that there is no single, arts and culture orientated product in the market which currently offers the required scope - and it is doubtful that a single product could achieve the wide variety of aims and handle the expanse of data which is required.

In order to better understand the challenges, we then conducted an experiment in the integration of a variety of social analytics tools. The intention was that this experiment would provide indications of the major technical and operational challenges which the Big Data Dashboard approach would trigger.

Technical approach to social analytics

We decided to build a rough prototype of the social analytics component of the Big Data Dashboard as an experiment. Over the course of a two week scratch development process to produce a non-customer-facing prototype, we addressed the following areas:-

Infrastructure

For the production of the dashboard and the integration of the various APIs, the final solution was chosen utilising the following:

Virtual server (VS) built on Rackspace [http://www.rackspace.co.uk/] using the Ubuntu 10.04 Linux distribution. A VS is ideal in instances like this where speedy rebuilds and scalability are integral demands. Rackspace UK have thus provided an excellent service. An image of the development server is available on request.

Ruby on Rails (or Rails) - open source web application framework utilising the Ruby programming language. Rails is a full-stack framework which from the perspective of the programmer makes it fast to develop upon.

Twitter Bootstrap - a front-end framework for fast web deployment http://twitter.github.com/bootstrap/. A bespoke front-end was not regarded as a priority and so Bootstrap was used providing the necessary HTML and CSS to form the user interface.

The following APIs were integrated into the dashboard:

Google Analytics
Facebook
Clicky
Klout
PeerIndex
Twitter

Challenges

The primary challenge in developing the dashboard was handling the variety of APIs. A prototype of the application was built initially using the PHP versions of the above APIs, however these were largely found to be unstable and poorly documented with no demonstrable use cases from the applicable vendor. Vendors regularly change their API specifications and therefore the absence of consistent or clear documentation is not unusual. The decision was then made to move to Rails utilising the Ruby versions (know as 'Gems') of the above the APIs. As the Ruby versions were more current, they proved to be more stable operationally. Inconsistencies did become apparent nonetheless and extensive code modification was necessary in order to make the application execute as wished.

The second most significant challenge came about once the APIs were 'plugged in' and the scale of the data coming back became clear. Facebook and Google for example return an extensive amount of data and identifying the most appropriate fields for the dashboard became a time consuming task.

Costs

A small number of the analytics providers detailed in the original scope were dropped due to costs incurred per call to their API. A goal of the project was to identify a cost effective means of accessing the data and so costs related to accessing specific APIs were deemed outside the current specification. Please note that the project did not suffer as a result; months later Twitter changed their terms and most of analytics providers found themselves without a data pipeline.

Lessons Learned

A single large lesson and several smaller lessons were learned (or more accurately, assumptions were verified) from this experiment which can usefully be taken forward into the strategic discussion at sectoral level.

- Data availability and quality are key
- Many in-house database providers (e.g.) have poor to non-existent data export/API capability (although in general this is improving)
- The flow of data from social networks is very large and mostly irrelevant
- Data is not necessarily free to access

- Choosing what data is relevant and which search terms meaningful is a challenge
- Presenting raw data is comparatively easy
- Interrogating data to produce useful, communicable information is a challenge

Next steps

As part of the organisational and sectoral data strategies recommended by the report, it is essential that the following issues are addressed:-

- Openness of data and access of organisations to "their" data
- Establishment of sector level data standards, metadata approaches and KPIs
- Costing of access to raw social data - with possible sectoral deal model
- Data-sharing standards to facilitate aggregate data collection by funders etc
- Information and support regarding current tools of relevance

The best way to summarise the key recommendation would be to consider the question, **how could Arts Council England work towards the establishment of an arts data API?** The same approach could be applied to other parts of the cultural sector. In addition, efforts could be made to **ensure maximum interoperability amongst cultural sector data**. However, this is not a call for a mandated, compulsory data model for the culture sector. That is an unrealistic concept for practical and political reasons. It is also an unnecessary concept given the speed of change in the sector. It is much better to agree on areas of common data and accept variation at the margins than to pursue an illusion of completeness across a sector as diverse in both output and data maturity level as the cultural sector. There is, however, much that can be done to improve the use of big data in the cultural sector which does not require central control.

Appendix Three: List of Interviewees and Contributors

Ed Richards, CEO, Ofcom
Professor Paul Moore, Ulster University
Jon Gisby, formerly C4
Matt Locke, formerly C4
Bill Thompson, BBC
Steve Gettings, Ofcom
Gill Whitehead, C4
Richard Deverill, BBC/Ofcom
Professor Stephen Heppell, Bournemouth University
Lord Puttnam
David Bott, Technology Strategy Board
Greg O'Hanlon, Ulster University
Jon Wardle, NFTS
Tony Hart, Amino Technologies
David Mahoney, Ofcom
Gill Johnson, ACE
Keith Todd, Fastffill plc
Patrick McKenna, Ingenious Media
Adam Singer, Cordelia Ltd
Honor Harger, Lighthouse
John Berry, English National Opera
Garry Lace, Beta London
Dr David Docherty, CIHE
Hasan Bakhshi, NESTA
Alexandra Albert, ACE
Mayur Upadhyaya, Glow Labs
Professor Hugh Montgomery, UCL
Professor Michael Depledge, University of Plymouth
Dr Mathew White, European Centre for Environment and Human Health
Sophie Jones, C4
Wang Bing, Beijing Cultural Foundation

About the Authors

Anthony Lilley

Anthony is a media practitioner and theorist with a background in creative, policy and academic spheres. He has a lifelong passion for the arts and began his professional career in theatre. He is Chief Creative Officer and CEO of Magic Lantern Productions Ltd, an award-winning interactive media and multiplatform creative house and consultancy and also a director of China/UK media specialists, Zespa Media.

Anthony has worked numerous on world leading brands including Top Gear, Doctor Who, The Guardian and many others as well as for clients as diverse as Sony Playstation, BBC, C4, IMG, London 2012, Google and Procter and Gamble. He works on transmedia strategy, develops creative concepts and advises on policy around the world including, most recently, in the UK, the US, Australia, China and Qatar.

He is a member of the Content Board of the UK's communications regulator, OfCOM, a board member of the UK Gambling Commission and was New Media Columnist of The Guardian Newspaper from 2006-08.

Anthony holds or has held Visiting Professorships at the University of Oxford and UK Centre of Excellence for Media at Bournemouth University. He is a Fellow of the Royal Society of Arts, a Trustee of the English National Opera and Chair of digital culture agency, Lighthouse. Anthony was awarded the Order of the British Empire (OBE) in the Queen's Birthday Honours list in 2008.

Professor Paul Moore

Having worked as a senior manager in the further education sector Professor Moore joined the University of Ulster in 1999 and has since been active in the development of the creative arts/industries policy in the university becoming head of the School of Creative Arts in 2008. He was awarded a personal chair in 2009 becoming Professor of Creative Technology at the Magee campus, and in 2010 was awarded a Distinguished Teaching Fellowship.

His research is focused on both the creative industries and the ways in which theory and practice can be brought together in training and education. He has published widely in a range of journals and his own art practice is in the area of sound art. He has produced a number of commissioned gallery exhibitions in Coventry, Belfast, Lough Neagh, the Void Gallery Derry and, most recently, the National Gallery in Namibia.

His consultancy work in the creative industries has been based largely in Africa and he has a number of roles in South Africa and Namibia, assisting in the development of creative learning hubs. He has fronted a number of creative arts training initiatives in Namibia sponsored by the Netherlands Institute for Southern Africa. He was a visiting professor at CityVarsity College in Cape Town and was an honorary research fellow with the University of Coventry.

He was chair of the Visonic Arts group in Belfast and is the Ofcom Content Board member for Northern Ireland. From 1995 to 2004 he was also a board member of the Northern Ireland Film and Television Commission. He was a member of the Digital Britain Working Group on Digital Participation (2009) and was a member of the UK Digital Participation Consortium. He also chairs the NI Media Literacy Hub and wrote the Digital Participation Plan for NI which was launched in March 2010. In his spare time he is a freelance broadcaster with BBC Radio Ulster and has written and presented a range of documentaries for BBC national radio.

Nesta

ARTS COUNCIL ENGLAND

University of ULSTER

COUNTING WHAT COUNTS